Iranian Journal of Basic Medical Sciences

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IJBMS

Prevalence of PER and VEB Type Extended Spectrum Betalactamases among Multidrug Resistant *Acinetobacter baumannii* Isolates in North-West of Iran

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ARTICLE INFO

Article type:
Original article

Article history:
Received: Jun 11, 2012
Accepted: Oct 23, 2012

Keywords:
Acinetobacter baumannii
Extended spectrum betalactamases
Integron class I

ABSTRACT

Objective(s): Drug resistant *Acinetobacter baumannii* have emerged as a major problem in many hospitals and intensive care units. Various types of extended spectrum beta-lactamases (ESBLs) are responsible for resistance to beta-lactam antibiotics in different parts of the world. The objective of this study was to determine the prevalence of integron class1 (INT 1) and ESBL types PER-1, PER-2 and VEB-1 among *A. baumanni* strains isolated from Tabriz, North-West of Iran.

Material and Methods: A total of 100 *A. baumannii* isolates collected from different clinical samples were included in the study. Antimicrobial susceptibility profiles were determined using the Kirby Bauer disk diffusion method. Production of ESBL was investigated by testing resistance against ceftazidime, cefotaxime, ceftriaxone and verified by Double Disk Synergy Test. DNA was extracted from the isolates and the frequency of INT 1 and ESBL types PER-1, PER-2 and VEB-1 were determined by PCR using specific primers.

Results: Among 100 *A. baumannii* isolates screened, 80 isolates were multidrug-resistant and 70 isolates were positive for ESBL production. PCR screening revealed that 74 % of the isolates contained class 1 integron, 51% were positive for PER-1 gene, 10% positive for VEB1 whereas none of the isolates were positive for PER2 type gene.

Conclusion: This is the first report of ESBL types VEB and PER in *A. baumannii* from North West of Iran. The results of this study demonstrated high prevalence of PER-1 and VEB-1 type ESBLs among *A. baumannii* isolates in the study region and reminded the necessity of appropriate infection control strategy to prevent further spread of infection by these organisms.

► *Please cite this paper as:*
Farajnia S, Azhari F, Alikhani MY, Hosseini MK, Peymani A, Sohrabi N. Prevalence of PER and VEB Type Extended Spectrum Betalactamases among Multidrug Resistant *Acinetobacter baumannii* Isolates in North-West of Iran. Iran J Basic Med Sci; 2013; 16: 751-755.

Introduction

Acinetobacter is a Gram-negative, aerobic, non-fermentative cocobacilli that has gained special attentions as a nosocomial opportunistic pathogen. Nutritional requirements of this bacterium are simple and they easily grow on most environmental conditions. *Acinetobacter* can survive on different medical equipments and even on healthy human skin (1). The multidrug-resistant *A. baumannii* (MDRAB) are defined as *A. baumannii* isolates that are resistant to at least three different classes of antimicrobial agents mainly betalactams, aminoglycosides, fluoroquinolones and carbapenems (2). There are increasing reports of MDRAB outbreaks in various clinical settings worldwide (3, 4). Carbapenems are currently the drugs of choice in the treatment of severe infections caused by this organism; however, carbapenem resistant *A. baumannii* is now reported increasingly throughout the world (5-8).

Extended spectrum beta lactamases (ESBLs) are a class of group A beta lactamases which results in hydrolysis of first, second, and third generation cephalosporines but are inhibited by beta-lactamase inhibitors like Acid clavulanic (9-11). Classic extended spectrum beta lactamases are originated from the plasmid encoding ESBLs of TEM (Temoneira) /SHV (sulphydril variable), and OXA

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